

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: David M. Hoffman

Title: TAILORABLE CT-DETECTOR ASSEMBLY

Appl. No.: 10/707,600

Filing Date: December 23, 2003

Examiner: Taningco, Marcus H.

Art Unit: 2884

**AMENDMENT AND REPLY UNDER 37 CFR 1.111**

Mail Stop AMENDMENT  
Commissioner For Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This communication is responsive to the Non-Final Office Action dated February 23, 2006, concerning the above-referenced patent application.

**Amendments to the Claims** are reflected in the listing of claims which begins on page 2 of this document.

**Remarks/Arguments** begin on page 6 of this document.

Please amend the application as follows:

**Amendments to the Claims**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**

1. (Currently Amended) An imaging detector assembly comprising:  
a detector array;  
a scintillator assembly positioned in communication with said detector array;  
a first collimator array optimized to shield said scintillator assembly, said first collimator array mounted to said scintillator assembly, wherein said first collimator array is comprised of an etched grid etched directly onto said scintillator array; and  
a second collimator array optimized to reduce x-ray scatter, said second collimator array mounted independently from said first collimator array.
2. (Original) An imaging detector assembly as described in claim 1, wherein said first collimator array has a first collimator width optimized to shield said scintillator and a first collimator height with minimal effect on said x-ray scatter.
3. (Original) An imaging detector assembly as described in claim 1, wherein said second collimator array has a second collimator height optimized to reduce said x-ray scatter and a second collimator width with minimal effect on shielding said scintillator.
4. (Original) An imaging detector assembly as described in claim 1, wherein said first collimator array and said second collimator array are comprised of high-Z, high atomic number materials.
5. (Currently Amended) An imaging detector assembly as described in claim 1, wherein said first collimator array is ~~comprises~~comprised of a material optimized to shield said scintillator.

6. (Original) An imaging detector assembly as described in claim 1, wherein said second collimator array is comprised of a material optimized to reduce x-ray scatter.

7. (Original) An imaging detector assembly as described in claim 1, wherein said second collimator width is less than 200 microns; and  
said first collimator width is greater or equal to said second collimator width. .

8. (Original) An imaging detector assembly as described in claim 1, wherein said first collimator array is comprised of a loaded epoxy formed directly onto said scintillator array.

9. (Currently Amended) An imaging detector assembly comprising: as described in claim 1,  
a detector array;  
a scintillator assembly positioned in communication with said detector array;  
a first collimator array optimized to shield said scintillator assembly, said first collimator array mounted to said scintillator assembly and wherein said first collimator array [[is]] comprised of a plunged electron discharge machined grid formed onto said scintillator array; and  
a second collimator array optimized to reduce x-ray scatter, said second collimator array mounted independently from said first collimator array.

10. (Canceled)

11. (Canceled)

12. (Currently Amended) An imaging detector assembly comprising:  
a detector array;  
a scintillator assembly positioned in communication with said detector array, said scintillator assembly comprised of a plurality of scintillator cells separated only by thin film reflectors;

a first collimator array optimized to shield said scintillator assembly, said first collimator array formed directly onto said scintillator assembly and said first collimator comprised of a grid etched directly onto said scintillator array; and

a second collimator array optimized to reduce x-ray scatter, said second collimator array mounted independently from said first collimator array.

13. (Canceled)

14. (Original) An imaging detector assembly as described in claim 12, wherein said first collimator array is optimized to improve the quantum detection efficiency of the imaging detector assembly.

15. (Original) An imaging detector assembly as described in claim 12, wherein said first collimator array has a first collimator width optimized to shield said scintillator and a first collimator height with minimal effect on said x-ray scatter.

16. (Currently Amended) A method of forming an imaging detector assembly comprising:

optimizing a first collimator array to generate scintillator shielding properties; mounting said first collimator array onto a scintillator assembly, said scintillator assembly comprising a plurality of scintillator elements, wherein mounting said first collimator array comprises etching a grid onto said scintillator assembly;

optimizing a second collimator array to reduce x-ray scatter; and mounting said second collimator array independently from said first collimator array, said first collimator positioned between said scintillator and said second collimator array.

17. (Original) A method of forming an imaging detector assembly as described in claim 16, further comprising:

manufacturing said second collimator array with greater tolerances than said first collimator array.

18. (Original) A method of forming an imaging detector assembly as described in claim 16, further comprising:

removing said second collimator array for use in a fourth generation imaging assembly.

19. (Canceled)

20. (Canceled)

21. (Original) A method of forming an imaging detector assembly as described in claim 16, further comprising:

separating each of said plurality of scintillator elements only by thin film reflectors; and

optimizing a first collimator width to generate an x-ray shielded portion that performs as an x-ray attenuator to reduce x-ray scatter within each of said plurality of scintillator elements.

REMARKS

Entry of the amendments is respectfully requested. Claims 1, 12, and 16 have been amended to further define the invention. Claim 5 has been amended to correct a typographical error. Claims 10, 11, 13, 19 and 20 have been canceled without prejudice or disclaimer. Applicants gratefully acknowledge the Examiner's finding that claims 9, 11, 18 and 20 contain patentable subject matter. Claim 9 has been rewritten in independent form. Claims 1-9, 12, 14-18 and 21 are currently pending in the application. Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

**1. Claim Rejections – 35 U.S.C. § 103**

**a. Claims 1-7, 16 and 17**

Claims 1-7, 16 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kingsley ("Kingsley," U.S. Patent No. 4,180,737). Applicant respectfully traverses the rejection. Independent claims 1 and 16 have been amended.

Independent claim 1 has been amended to include the limitation of claim 11 that the first collimator array is comprised of an etched grid etched directly onto the scintillator array. Independent claim 16 has been amended to include the limitation of claim 20 that mounting a first collimator array comprises etching a grid onto said scintillator assembly. In contrast, Kingsley does not teach or suggest a first collimator array that comprises a grid etched directly onto the scintillator array. In the Office Action at page 6, the Examiner indicates that the prior art "...fails to teach or suggest the collimator comprised of etching a grid directly onto the scintillator array." Accordingly, claims 1 and 16 are believed to be allowable over Kingsley.

Claims 2-7 depend from amended claim 1 and incorporate all of the limitations of amended claim 1 and are therefore allowable over Kingsley for, among other reasons, the same reasons as given above with respect to amended claim 1. Claim 17 depends from amended claim 16 and incorporates all of the limitations of amended claim 16 and is therefore allowable over Kingsley for, among other reasons, the same reasons as given above with respect to amended claim 16.

Accordingly, claims 1-7, 16 and 17 are believed to be allowable. Withdrawal of the rejection under 35 U.S.C. §103(a) and allowance of claims 1-7, 16 and 17 is respectfully requested.

**b. Claims 8 and 19**

Claims 8 and 19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kingsley in view of Hoge (“Hoge,” U.S. Published Patent Application No. 2004/0217291). Claim 19 has been canceled. Claim 8 depends from amended claim 1 and incorporates all of the limitations of amended claim 1 and is therefore allowable over Kingsley in view of Hoge for, among other reasons, the same reasons as given above with respect to amended claim 1.

Accordingly, claim 9 is believed to be allowable. Withdrawal of the rejection under 35 U.S.C. §103(a) and allowance of claim 8 is respectfully requested.

**c. Claim 10**

Claim 10 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Kingsley in view of Joung et al. (“Joung,” U.S. Published Patent Application No. 2005/0017182). Claim 10 has been canceled.

**d. Claims 12, 15 and 21**

Claims 12, 15 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kingsley in view of Schafer et al. (“Schafer,” U.S. Patent No. 6,091,795). Applicant respectfully traverses the rejection.

Independent claim 12 has been amended to include the limitation that the first collimator comprises a grid etched directly onto said scintillator array. Neither Kingsley or Schafer, in combination or alone, teaches or suggests a first collimator array that comprises a grid etched directly onto the scintillator array. In the Office Action at page 6, the Examiner indicates that the prior art "...fails to teach or suggest the collimator comprised of etching a grid directly onto the scintillator array." Accordingly, claim 12 is believed to be allowable over Kingsley.

Claim 15 depends from amended claim 12 and incorporates all of the limitations of amended claim 12 and is therefore allowable over Kingsley in view of Schafer for, among other reasons, the same reasons as given above with respect to amended claim 12. Claim 21 depends from amended claim 16 and incorporates all of the limitations of amended claim 16 and is therefore allowable over Kingsley in view of Schafer for, among other reasons, the same reasons as given above with respect to amended claim 16.

Accordingly, claims 12, 15 and 21 are believed to be allowable. Withdrawal of the rejection under 35 U.S.C. §103(a) and allowance of claims 12, 15 and 21 is respectfully requested.

**e. Claim 13**

Claim 13 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Kingsley and Schafer in view of Joung. Claim 13 depends from amended claim 12 and incorporates all of the limitations of amended claim 12 and is therefore allowable over Kingsley and Schafer in view of Joung for, among other reasons, the same reasons as given above with respect to amended claim 12. Accordingly, claim 13 is believed to be allowable. Withdrawal of the rejection under 35 U.S.C. §103(a) and allowance of claim 13 is respectfully requested.

**f. Claim 14**

Claim 14 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Kingsley and Schafer in view of Hoge. Claim 14 depends from from amended claim 12

and incorporates all of the limitations of amended claim 12 and is therefore allowable over Kingsley and Schafer in view of Hoge for, among other reasons, the same reasons as given above with respect to amended claim 12. Accordingly, claim 14 is believed to be allowable. Withdrawal of the rejection under 35 U.S.C. §103(a) and allowance of claim 14 is respectfully requested.

## **2. Allowable Subject Matter**

Claims 9, 11, 18 and 20 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants gratefully acknowledge the Examiner's finding that claims 9, 11, 18 and 20 contain patentable subject matter.

Claim 9 has been rewritten in independent for including all of the limitations of the base claim and any intervening claims. Claims 11 and 20 have been canceled. Claim 18 depends from amended claim 16 and incorporates all of the limitations of amended claim 16 and is therefore allowable for, among other reasons, the same reasons as given above with respect to amended claim 16.

## **3. Conclusion**

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 070845. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge

the unpaid amount to Deposit Account No. 070845. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. § 1.136 and authorizes payment of any such extension fees to Deposit Account No. 070845.

Respectfully submitted,

Date: 5/22/06

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